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Spatial Consumer Behaviour in Small and Medium-sized Towns

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VAN LEEUWEN E. S. and RIETVELD P. Spatial consumer behaviour in small and medium-sized towns, *Regional Studies*. Small and medium-sized towns are often recognized as important components of the rural economy. This paper focuses on the current function of small and medium-sized towns in providing retail services to local households in five European countries. Furthermore, it analyses the spatial shopping behaviour of these households. It appears that towns are still important places for shopping: more than half of the purchases of households living in town or the direct hinterland are bought in town.

Shopping behaviour Towns Spatial analysis Discrete choice Out-shopping

VAN LEEUWEN E. S. and RIETVELD P. 中小城市空间消费行为，区域研究 。中小型城镇往往被看作是农村经济的重要组成部分。本文重点考察了五个欧洲国家中小型城镇为当地住户提供零售服务的职能。此外，文章还分析了上述住户的空间购物行为。研究表明城镇仍然是重要的购物场所：对于居住在城镇或周边地区的住户而言，其一半以上的购物行为是在城镇中完成的。

购物行为 城镇 空间分析 离散选择 外出购物

VAN LEEUWEN E. S. et RIETVELD P. Le comportement géographique du consommateur dans les villes petites et moyennes, *Regional Studies*. Les villes petites et moyennes sont souvent considérées comme d'importants rouages de l'économie rurale. Cet article porte sur la fonction actuelle des villes petites et moyennes comme pourvoyeuses du commerce de detail aux ménages locaux dans cinq pays européens. Qui plus est, on analyse le comportement commercial géographique de ces ménages. Il semble que les villes sont toujours d'importants endroits où on fait les courses: plus de la moitié des achats des ménages qui habitent les villes ou l'arrière-pays immédiat se font dans les villes.

Comportement commercial Villes Analyse géographique Choix discret Faire les courses au dehors de la ville

VAN LEEUWEN E. S. und RIETVELD P. Räumliches Verbraucherverhalten in kleinen und mittelgroßen Städten, *Regional Studies*. Kleine und mittelgroße Städte werden oft als wichtige Komponenten der Wirtschaft im ländlichen Raum anerkannt. In diesem Beitrag untersuchen wir die momentane Funktion von kleinen und mittelgroßen Städten hinsichtlich des Anbietens von Einzelhandelsdiensten für lokale Haushalte in fünf europäischen Ländern. Darüber hinaus wird das räumliche Einkaufsverhalten dieser Haushalte analysiert. Es hat den Anschein, dass es sich bei den Städten nach wie vor um wichtige Einkaufsorte handelt: Mehr als die Hälfte der Einkäufe von Haushalten, die in der Stadt oder im unmittelbaren Hinterland leben, werden in der Stadt getätigt.

Einkaufsverhalten Städte Raumanalyse Discrete Choice Auswärts einkaufen

VAN LEEUWEN E. S. y RIETVELD P. Comportamiento espacial de compra en ciudades pequeñas y medianas, *Regional Studies*. Con frecuencia se reconoce que las ciudades pequeñas y medianas son componentes importantes en la economía rural. En este artículo analizamos la función actual de las ciudades pequeñas y medianas de cinco países europeos en cuanto a sus servicios minoristas a hogares locales. Asimismo analizamos el comportamiento espacial de compra en estos hogares. Parece ser que este tipo de ciudades todavía son centros importantes de compra: más de la mitad de las compras de personas que viven en ciudades o directamente en el interior se hacen en las ciudades.

Comportamiento de compra Municipios Análisis espacial Elección discreta Compras fuera del centro

JEL classifications: D12, R12

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INTRODUCTION

Retailing is a key element of service provision in rural areas. Changes in retailing trends and consumer behaviour have led to difficulties in establishing adequate retail provision in these areas. The decline and closure of local and village stores, and the perceived high levels of 'out-shopping' from rural to urban locations, are all symptoms of the problem (FINDLAY and SPARKS, 2008).

The functional relationship between a town and its hinterland can be indicated by a specific flow of products and services from the central place to its hinterland, or by a reverse flow of demand from the hinterland to the central place (KLEMMER, 1978). However, in smaller communities, the competitive nature of the rural market has significantly changed. Better travel conditions along with attractive regional shopping centres entice consumers to travel beyond their local markets. Although the high level of car ownership in rural areas makes it easier for rural residents to 'use' local town facilities, it also allows them to travel even further to larger cities (MILLER and KEAN, 1997; POWE and SHAW, 2004). However, not everyone is able to travel further away for their daily necessities. There is a group of consumers, such as households with young children, disabled persons or the elderly, who are not so mobile. In particular for those persons, local facilities are of utmost importance (POWE *et al.*, 2009). Traditionally, towns act as a concentration point of facilities, both for households living in town and for households living in (often) more remote locations in the hinterland (COURTNEY *et al.*, 2007). However, it is not really clear to what extent this is still the case, and for which activities and services this holds in particular.

Especially in the United Kingdom, small and medium-sized (market) towns are seen as important components of the economic structure of the country, having the capacity to act as a focal point of trade and services for a hinterland (THE COUNTRYSIDE AGENCY, 2000; COURTNEY and ERRINGTON, 2000). Despite the lack of research into the role of (market) towns in alleviating problems in the provision of rural services, they are increasingly being targeted by rural development policies as centres for service provision and growth, in particular in the UK (POWE and SHAW, 2004). Although it is likely that medium-sized towns do play an important role in servicing their hinterlands, it is unclear what form this takes and upon which (spatial) factors the role depends. Another important research question is whether small and medium-sized towns are equally important in different European Union countries.

The aim of this article is to explore the current function of European small and medium-sized towns (with a population between 5000 and 20 000) in providing retail services to local households and to analyse the spatial shopping behaviour of these households. Therefore, the first part of this article will focus on the importance of small and medium-sized towns for rural households in five European countries as a location to shop (for a list of the selected towns, see Appendix A). Furthermore, with the help of a set of correlations, the determinants of local orientation in shopping behaviour are explored. Attention is then turned to households in a selection of six Dutch towns and their spatial shopping behaviour is described in more detail. A multinomial logit model is used to explain the choice of households to shop in town, or in the direct hinterland, or in larger cities further away. Rural spatial–economic conditions, such as the accessibility and supply of shops, are related to the local households' socio-economic characteristics, such as place of work, age, and income. An additional interesting variable, which is not often included in this kind of research, is the length of residence of the households. It is to see how 'local attachment' affects local shopping. This helps one to understand which factors are important for the households' choice to use the town, or the hinterland, or a place outside the region for its shopping.

CONSUMER BEHAVIOUR IN RURAL AREAS

An important decision for a consumer to make is the choice of where to shop. This decision often involves a dual choice of shopping area (in the neighbourhood or out of town) as well as the specific store to be visited (NEVIN and HOUSTON, 1980). Important methods used to estimate the behaviour of consumers, or to predict retail trade areas, are the Central Places theory of CHRISTALLER (1933/1966), as well as the gravitational models, such as the one proposed by HUFF (1964). The value of Central Place theory lies in its ability to consider simultaneously the behaviour of consumers and retail firms in a spatial market (CRAIG *et al.*, 1984). According to CHRISTALLER (1933/1966), the spatial behaviour of consumers is conditioned by:

- the size and importance of the central place;
- the price-willingness of the consumer;
- the subjective economic distance; and
- the type, quantity and price of the good.

Despite these four factors, often the focus has been put on the idea that, apparently, consumers patronize the nearest place that offers the required good. This premise has been labelled as 'the nearest centre postulate' (CLARK and RUSHTON, 1970, also HUBBARD, 1978). Empirical tests showed that in undeveloped areas, often with less mobile consumers, the postulate applied surprisingly well. However, in the developed world, it appeared that the hypothesis provided an inadequate description of consumer behaviour (HUBBARD, 1978).

Although Christaller himself was aware of the limitations of the Central Place theory due to the stationary state, there are more shortcomings. Firstly, the theory is limited to services, not including functions such as the manufacturing industry that creates employment and population growth. Secondly, it does not take into account historical patterns and it assumes little governance influence on the location choice of businesses (PACIONE, 2009). Furthermore, as mentioned above, the assumption that consumers look to the nearest place for their necessities does not hold (anymore). Research showed that consumers are likely to bypass the closest alternative if the extra (travel) effort is compensated by better shopping opportunities (CRAIG *et al.*, 1984). In addition, telecommunications allowed for online shopping, which further eroded the frictional effect of distance on consumer behaviour (PACIONE, 2009).

When analysing the consumer behaviour of households, three important groups of factors should be considered:

- The consumer with all his/her characteristics.
- The characteristics of the shop or retail centre, including its location.
- The reason for shopping, or the kind of product purchased.

Before addressing these three dimensions, note that in the literature on the spatial behaviour of consumers a distinction is often made between in-shopping (for example, in town) and out-shopping (for example, out of town). According to MILLER and KEAN (1997), it is not necessarily true that factors affecting in-shopping are the same as those affecting out-shopping, thus clarifying dissimilarities between some studies.

The socio-economic characteristics of consumers are fundamental in that they affect, for example, the degree of consumer spatial mobility (HUBBARD, 1978). When looking at consumer-related factors, in most out-shopping studies a higher level of income seems to be related to a higher share of purchases outside town (HERMANN and BEIK, 1968; THOMPSON, 1971; PAPADOPOULOS, 1980). Apparently, households with a higher income are more readily able to bear the costs of shopping around (HUFF, 1959). Nevertheless, when focusing on in-shopping, there seems to be no significant income effect (PINKERTON *et al.*, 1995; MILLER and KEAN, 1997).

Another important consumer-related factor is age. It is often stated that older persons are less mobile and therefore more likely to shop close to their place of residence (PINKERTON *et al.*, 1995; POWE and SHAW, 2004; PAPADOPOULOS, 1980). They are also supposed to be more attached to the local area. However, attachment can also be measured by length of residence (BROWN, 1993) or satisfaction with the community.

Another relevant consumer-related factor is the family situation, such as whether a family has young children. HERMANN and BEIK (1968) and MILLER and KEAN (1997) found that households with young children tend to do less out-shopping (or more in-shopping).

A final important variable is the place of work of the consumer. As PAPADOPOULOS (1980, p. 57) described, sometimes consumers would not consider travelling a longer distance for their shopping; but once a consumer reaches a larger trade centre, for whatever other reason (such as work), shopping appears to become a significant secondary activity. Another interesting study is that of FINDLAY *et al.* (2001), who studied the links between migration status, commuting patterns, and out-shopping. They concluded that incomers – as they define people who moved less than sixteen years ago to the local area – tend to do more out-shopping, but it is commuting that is the primary determinant of out-shopping.

Besides these consumer-related factors, supply factors, related to the shop or the retail centre, affect the shopping behaviour of households. Firstly, a destination has to be in reach of a consumer. This means that the distance to a shopping facility is important. Distance can be measured in many different ways such as in a straight line, by road, or in a cognitive way (CADWALLADER, 1975). Nevertheless, for all kinds of distances it holds that the further away a facility, the less likely it is that a consumer will go there. Another important supply factor is the attractiveness of the destination. This attractiveness can be estimated in many different ways as well, such as by the accessibility of the destination, the quality of service, or the supply of products. GORTER *et al.* (2003), for example, used the quality of parking facilities and the atmosphere in shops. Another variable often used is the available floor space. According to SCHENK *et al.* (2007), both price and assortment characteristics are very closely related to the size of the store. HUFF (1964) was one of the first to use this proxy. The rationale underlying this assumption is that larger shops or retail centres generally offer a greater selection of merchandise than smaller ones, which reduces the uncertainty regarding the possibility of an unsuccessful shopping trip (HUBBARD, 1978).

The third and last group of factors is related to consumers having different reasons for shopping, for which different kinds of shopping locations are most suitable. In general, shopping visits to city centres are made for reasons of pleasure, whereas the use of peripheral centres for shopping purposes is more frequently explained by narrower economic motives (GORTER *et al.*, 2003).

Different kinds of shopping can also be categorized as run, fun and goal shopping (GORTER *et al.*, 2003; EVERS *et al.*, 2005). Run shopping is supposed to be an efficient activity in which particular, predetermined (everyday) goods are to be bought as quickly as possible (for example, after working hours on the trip from work to home). This kind of shopping activity may take place

at the fringe of the city, or in smaller shopping centres close to the place of residence. In contrast, fun shopping is associated with visits to several (comparable) shops for pleasure and socializing. This kind of shopping is more dependent on hedonistic influences, such as style, recreational activities, and social pressures (SCHENK *et al.*, 2007). This is most likely to take place in concentrated city centres in which there is a wide variety of shops and goods, as well as many opportunities for leisure. Finally, goal shopping also deals with predetermined purchases, but includes shopping for furniture, do-it-yourself products, or for plant and garden products. Like run shopping, this kind of shopping is also supposed to be efficient, but not on a daily basis. It may predominantly take place at the fringe of the city.

However, it appears that a large share of the trips that people make involve stops at more than one location (GHALY, 1990). DELLAERT *et al.* (1998) suggested that this is due in part to increasing time pressure faced by consumers.

DATA COLLECTION

For this study, data collected as part of a transnational project – the European Union research MARKET-OWNS project – were used.[1] This project focused on the role of small and medium-sized towns as growth poles in regional economic development. For this purpose, it was necessary to measure the flow of goods, services, and labour between firms and households in a sample of thirty small and medium-sized rural towns in five European Union countries. The participating countries reflect the varied conditions of the existing and enlarged European Union, namely France, Poland, Portugal, the Netherlands, and England.

In each of the participating countries, six small and medium-sized towns were selected with reference to a set of relevant, predefined criteria. For instance, the condition that no other town with more than 3000 inhabitants should be located in a hinterland with a radius of approximately 7 km. Furthermore, small towns were defined as towns with a population of 5000–12 500 inhabitants; and medium-sized towns as towns with a population of 12 500–20 000 inhabitants. In each country, two towns located in agricultural areas were selected, two in tourism regions, and two situated more closely to a (large) city. In this way, different kinds of towns were included.

In order to compare the nature and strength of linkages throughout the wider economy, four different zones were defined around each town. These were designed to facilitate comparisons between the different areas. As a result, the study area from which households were sampled comprised the town and a 7 km radius around it (the direct hinterland). In turn, this boundary also encompassed two of the four predefined zones used for the economic analysis (Table 1).

Table 1. *Defined zones around the town under research*

	Zone	Definition	Remark
A	Town	Within the town	Area of residence of households from the sample
B	Hinterland	Up to 7 km from the town	
C	7–16 km zone	7–16 km from the town	
D	Supra-regional	Outside the region	

Primary data were collected using self-completion survey techniques to measure the spatial economic behaviour of households. The household questionnaire focused on spatial patterns of consumer purchases by distinguishing between different categories of goods and services and expenditure patterns across the predefined geographical zones. The households were asked to write down their expenses for different kinds of products during the preceding four weeks and the distribution of the expenses over the different zones. Surveys were carried out between September 2002 and May 2003 (TERLUIN *et al.*, 2003), and in total 6000 were collected.

SHOPPING IN RURAL AREAS; THE IMPORTANCE OF TOWNS FOR LOCAL HOUSEHOLDS

Supply of shops

Shopping behaviour is largely influenced by the availability and accessibility of retail businesses. Table 2 shows the average figures for the number of shops in the town and the hinterland, the number of inhabitants per shop, and the number of employees per shop (which indirectly indicates the average size of the shops).

It appears that in England the number of shops in town and especially in the hinterland is relatively low. However, at the same time the number of employees per shop is high, implying that the shops are larger. In Portugal, on the other hand, a great number of shops are located in both town and hinterland. However, the shops are smaller, with on average two employees per shop, and each serves only around forty inhabitants. In Poland, the number of shops in town is also high. However, in the hinterland there the number of shops is smaller and the number of inhabitants per shop is much higher than in Portugal.

Interestingly, the average number of inhabitants per employee in the towns is rather similar in the countries under research. The differences seem to appear in the hinterland, with a high number of inhabitants per shop or employee in England, and a low number in Portugal.

Location of purchases

Fig. 1 shows the average distribution of aggregate household purchases over different zones; zone A

Table 2. Average supply of retail services in the town and the hinterland in five countries

	Number of shops[a]		Number of inhabitants per shop		Number of employees per shop		Number of inhabitants per employee	
	Town	Hinterland	Town	Hinterland	Town	Hinterland	Town	Hinterland
England	92	19	115	652	7.2	12.5	16	55
France	112	41	116	317	–	–	–	–
Netherlands	113	188	118	167	5.0	3.8	24	48
Poland	317	94	38	81	2.4	2.1	17	41
Portugal	397	636	44	36	2.3	1.7	21	23

Note: [a]Average of six towns included per country.

(town), zone B (hinterland, 7 km zone), zone C (7–16 km zone), and the supra-regional zone (D). The next section describes a disaggregation of purchased products and services. It appears that in all countries the towns are the most important places for shopping. Especially the Portuguese and the Polish town households do most of their shopping in town and only a relatively small part outside the region. English town households, on the other hand, purchase the smallest part in town, but this is still on average 60%. Instead, around one-quarter of total expenditures are spent supra-regionally.

Fig. 2 shows the distribution of purchases of hinterland households. In almost all countries (except the Netherlands), the hinterland households too buy most goods and services in town. This suggests that the Central Place theory (CHRISTALLER, 1933/1966) is still valid. In France, hinterland households buy only 10% of their consumption in the hinterland itself. Instead, these households go to town for their shopping: almost 60% of all purchases are bought there (comparable with the share of town households). This is probably because there are only a small number of shops in the French hinterland. In England as well, only 12% of the purchases of hinterland households is done in the hinterland. Just like the English town households, the English hinterland households buy a relatively large share outside the region (around 25%), as well as 45% in town.

In the other three countries, around one-third of the purchases are bought in the hinterland. The

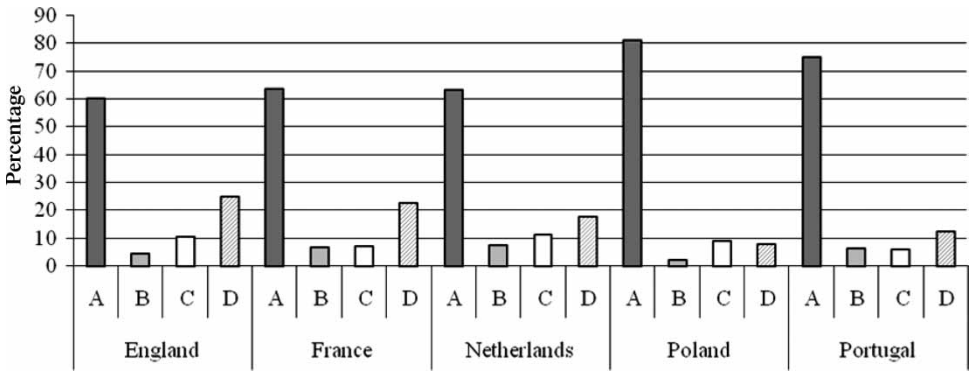

Fig. 1. Average share of purchases in zones A, B, C, and D by town households

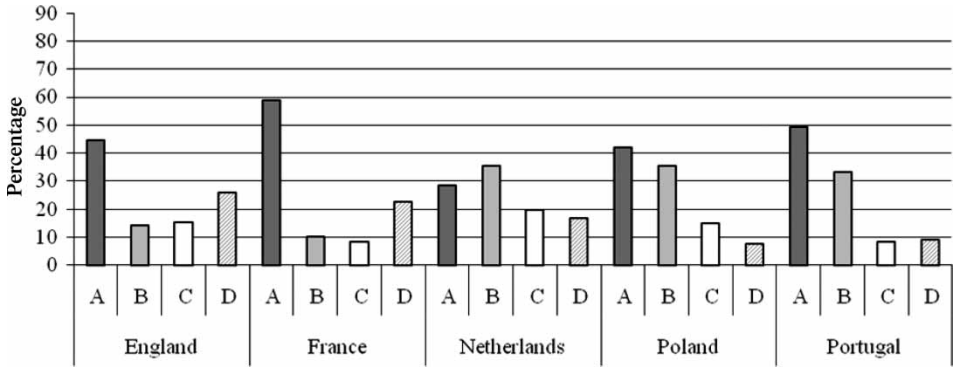

Fig. 2. Average share of purchases in zones A, B, C, and D by hinterland households

Netherlands is the only country in which the hinterland households make more purchases in the hinterland itself than in town; furthermore, they buy a relatively large share in the 7–16 km zone. Here, the purchases are more evenly spread over the four zones. An explanation for this is the relatively high population density in the Dutch rural areas.

Apparently, in England and France there is little difference between town and hinterland households; for both groups, the town is the most important place to buy goods and services. In France, this can be explained by the small number of households living in the hinterland, which explains the small number of shops. However, in England the number of households in the hinterland is much higher and very similar to the situation in Poland, while in Poland the shops in the hinterland are much more important. From the data it appears that in England only 6% of the households living in the hinterland do not own a car compared with 22% in Poland. This could clarify the different shopping behaviour of these households.

When focusing on different goods and services (for more details, see VAN LEEUWEN, 2010), it appears that in all countries the town is especially the place where both town and hinterland households buy most of their pharmaceutical products as well as their medical care and dentistry. In general, food and groceries, domestic help and childcare, as well as hairdressing and beauty care are products mostly bought in the zone of residence.

CORRELATION ANALYSIS OF THE SPATIAL DISTRIBUTION OF PURCHASES

In the above section it became clear that the differences of spatial behaviour of town households and hinterland households are rather distinctive. Therefore, this section explores the relationships between the spatial shopping behaviour of households in town or hinterland and the characteristics of the area in which they live by using Pearson correlation techniques. For the analysis, individual household data are used (6000 households in and around all thirty towns), and a distinction is made between town households shopping in town (zone A), town households shopping in the hinterland (zone B), hinterland households shopping in town, and hinterland households shopping in the hinterland. Furthermore, Table 3 distinguishes between low-order (every-day products and services such as food, newspapers or pharmaceuticals) and high-order products (for example, clothes, furniture or the opera) because the behaviour related to these two groups of products and services might be different.

Table 3 shows that the location of work does affect the location of shopping. Having a job in town (zone A) is positively related to the share of purchases made in town by both households living in town and living in the hinterland. Having a job in the hinterland (zone B) has the opposite effect. Having a job further away, in zone C, seems mainly to affect shopping in town.

The availability of shopping opportunities, measured by the number of shops, seems to make a zone more attractive for shopping: hinterland households shop more in the hinterland and less in town when there are more shops in the hinterland; and town households shop more in the hinterland when more shops are located there. However, a larger number of shops in town also appears to have a positive effect on shopping in hinterland shops. The correlation between the size of the population and the share of shopping in town or hinterland shows similar patterns. The size of the town population is related more to expenditures in both town and hinterland. Possibly larger towns have more urbanized hinterlands than have smaller towns.

Table 3. *Correlations between purchases (low-order and high-order goods) of town households in the town and the hinterland and various spatial variables; the same for purchases of hinterland households in the two zones in all countries*

	Town household				Hinterland household			
	Shopping location: town		Shopping location: hinterland		Shopping location: town		Shopping location: hinterland	
	Low order	High order	Low order	High order	Low order	High order	Low order	High order
Job in A	0.258**	0.481**	−0.063**	−0.053**	0.170**	0.181**	−0.110**	−0.118**
Job in B	−0.067**	−0.003	0.059**	0.034	−0.072**	0.188**	0.174**	0.173**
Job in C	−0.144**	−0.165**	0.016	0.052*	−0.080**	−0.150**	−0.007	0.031
PopA (ln)	0.093**	0.196**	0.234**	0.158**	0.152**	0.246**	0.192**	0.127**
PopB (ln)	−0.410**	−0.270**	0.592**	0.418**	−0.367**	−0.278**	0.546**	0.348**
Shops A (ln)	0.316**	0.769**	0.312**	0.298**	0.330**	0.745**	0.222**	0.225**
Shops B (ln)	−0.252**	0.178**	0.679**	0.612**	−0.252**	0.079**	0.611**	0.534**
Highway exit in zone A or B	−0.304**	−0.410**	0.161**	0.140**	−0.369**	−0.410**	0.196**	0.181**
Distance city 100 000 (ln)	0.420**	0.431**	−0.207**	−0.226**	0.479**	0.453**	−0.288**	−0.317**

Note: **Significant at the 0.01 level (two-tailed); and *significant at the 0.05 level (two-tailed).

The underlying data do show that the town population has a stronger (positive) correlation to the number of shops in the hinterland than the hinterland population is to the number of shops in town.

The presence of a highway exit in the area (either town or hinterland) appears to be related to fewer expenditures in town by town or hinterland households and by more expenditures in the hinterland. An explanation for this could be that often larger shops are located near highway exits just outside the urban area, which makes them attractive to both groups of households. Furthermore, the correlation between local purchases and the distance to a larger city (of 100 000 inhabitants) was examined. It appears that the further away the larger city is, the more important the town becomes for shopping, and the fewer the purchases made in the hinterland. Often the larger the distance to the city is, the less urbanized the local area is, with fewer shopping opportunities in the hinterland, but with a relatively higher importance of the town for shopping.

Finally, when comparing the results for low-order and high-order products, it appears that they are relatively similar. In almost all cases the sign is the same. However, the size of the coefficient and the significance sometimes differ. Having a job in zone B, for example, significantly affects purchases of low-order products by town households (they buy less in town and more in the hinterland). However, no significant effect appears on the purchase of high-order products.

SPATIAL SHOPPING BEHAVIOUR OF DUTCH HOUSEHOLDS

A disadvantage of the specification used above, apart from the bivariate nature, is that shopping orientation in the two zones is analysed without taking into account the supply of shopping facilities elsewhere. That the supply of shopping alternatives elsewhere is important was already observed in Fig. 2, which shows that in countries such as England, France, and the Netherlands, the share of purchases in the 7–16 km zone and in the rest of the world typically is around 30–40%. For a better understanding, more complete data on the supply of shopping facilities are needed. These are only available for the Netherlands, and hence the analysis is continued only for shopping in Dutch towns. The higher level of the spatial detail in the case of the Dutch data also has the advantage that one can analyse the spatial orientation of shopping behaviour as the result of an explicit comparison of four spatial alternatives by means of a multinomial logit model.

Focus is made on the three described kinds of shopping: grocery or run shopping; fun shopping (such as shopping for clothes, shoes, and different kinds of luxuries, etc.); and goal shopping (shopping for furniture, gardening products, do-it-yourself products, etc.). Although in a number of studies it has been argued that many shopping trips are multipurpose trips, which means that the purchase of different goods and services is combined (ARENTZE *et al.*, 1993; OPPEWAL and HOLYOAKE, 2004), POPKOWSKI-LESZCZYC *et al.* (2004) showed that in general grocery shopping is not part of multipurpose shopping, possibly because groceries need refrigeration. Therefore, in the present authors' opinion, a broad distinction between grocery, fun, and goal shopping is justifiable.

Characteristics of Dutch town and hinterland households

Table 4 shows the socio-economic characteristics that are relevant to the shopping behaviour of the households included in the analysis. Not surprisingly, most of the households own one or more vehicles,[2] especially in the hinterland (96%). Furthermore, the average age of the head of the household is around fifty years (slightly higher in the towns); and the average length of residence in the municipality is thirty-six years, which seems fairly high. In addition, it can be seen that a larger share of households living in the hinterland are families with children under seventeen years of age. Finally, around one-quarter of those with a job (a maximum of two jobs per household) work in zone C; almost half of the hinterland households work in the hinterland;[3] and 35% of the town households have a job in town.

Table 5 shows the shopping behaviour of households for different groups of products: grocery shopping; fun shopping (shopping for clothes, shoes, and different kinds of luxuries, etc.); and goal shopping (shopping for furniture, gardening products, do-it-yourself products, etc.). As was also shown in the fourth section, households living in towns buy most of their products locally: half of the fun purchases are bought in town and as much as 90% of all groceries. Households do

Table 4. *Socio-economic characteristics of households in the database (six towns in the Netherlands)*

Characteristic	Residential zone	
	Town	Hinterland
Owning one or more vehicles (%)	88	96
Average age of the head of the household (years)	53	48
Average length of residence (years)	35	37
Average income[a]	5.2	5.0
Households with children (less than seventeen years of age) (%)	25	35
Job in town (%)[b]	35	15
Job in the hinterland (%)[b]	11	46
Job in the 7–16 km zone (%)[b]	26	23

Notes: [a]Ten per cent income groups (1–10) were used.
[b]As a share from all persons with a job.

Table 5. *Average share (%) of purchases bought in the four zones for different kinds of product groups (six towns in the Netherlands)*

		Location of the shop			
Residential zone	Kind of purchase	Town	Hinterland	7–16 km zone	Supra-regional
Town	Grocery	90	6	3	1
	Fun	49	8	15	38
	Goal	72	8	12	8
	Average	74	7	8	11
Hinterland	Grocery	38	46	15	1
	Fun	27	27	24	22
	Goal	33	41	20	6
	Average	33	40	19	8

not often visit the hinterland for shopping, but around 15% of fun shopping and goal shopping is done in the 7–16 km zone.

The hinterland households, on the other hand, do visit the town for their purchases: around one-third of all their products are purchased in town. This means that the town has a supra-local function, even for groceries which are products often bought nearby (in the zone of residence). At the same time, 40% of hinterland households' shopping took place in the hinterland itself, and 19% in the 7–16 km zone. As expected, it is especially everyday products that are bought in the zone of residence of the households.

Multinomial logit model of spatial shopping behaviour (MNL)

In order to analyse the impact of a set of relevant variables on the revealed location choice of households measured by the share of total purchases in each zone (as shown in Table 6), a multinomial logit (MNL) model is used. The present analysis confines itself to a standard MNL model. An alternative would have been to address explicitly the multilevel structure of the data. This can be done, for example, by dropping the assumption of independence of errors in the logit model and by accounting for a possible correlation in unobserved features of residents living in the same zone (for example, MERCADO and PÁEZ, 2009). The MNL model is based on the assumption that consumers maximize their utility (HENSHER *et al.*, 2005). In a utility function of consumer i (U_i), the preferences of consumers for certain characteristics of the alternatives are represented, including a non-observable (error) term (ε_i). The model estimates the utility of households for shopping in zones A (town), B (hinterland), C (7–16 km zone), or D (supra-regional). The utility function $U_i(j)$ relates to the utility of a resident i living in or near one of the five market towns considered to shop in zone j of the pertaining market town region (j can be A, B, or C). The market towns are located far away from each other so that it is not an issue that a respondent i living near one of the market towns would shop in another market town. The utility functions for shopping in zone j can be formulated as:

$$U_i(j) = \alpha \ln dist_{ij} + \beta \ln floor_{ij} + \gamma job_{ij} + \delta(\ln dist_{ij} * car_i) + \theta(age_i * \ln dist_{ij}) + \iota \ln year_i + \varepsilon_{ij} \quad (1)$$

where j = A, B, or C.

The utility of the various shopping destinations (town, hinterland, 7–16 km zone) depends on four types of factors: the generalized cost of getting there, the variety offered, multipurpose trips and local embeddedness. They will be discussed in more detail below. The generalized costs are assumed to be proportional to distance to the zone,[4] where interaction effects are incorporated with age and car ownership to verify whether the generalized costs vary with these factors. The interaction with age takes into

Table 6. *Estimation results of a multinomial logit model explaining the choice of shopping in zone A, B, or C*

	Groceries (R^2-adjusted = 0.60)		Fun (R^2-adjusted = 0.13)		Goal (R^2-adjusted = 0.30)	
Explanatory variable	Coefficient	*t*-value	Coefficient	*t*-value	Coefficient	*t*-value
ln*DIST*	−1.34	−5.561	−0.65	−3.302	−1.15	−4.034
ln*FLOOR*	0.59	11.474	0.37	7.919	0.28	5.334
JOB	0.50	4.418	0.18	2.224	0.40	4.256
*CAR**ln*dist*	0.08	0.460	0.08	0.570	0.47	2.130
*AGE**ln*dist*	0.002	0.508	−0.007	−0.293	−0.001	−0.389
ln*YEAR*	0.26	5.842	0.02	0.518	0.07	1.721

account the possibility that the orientation of trips might be different between older and younger residents, for example because older residents have more leisure time. The interaction between distance and car ownership has been added in order to take into account the fact that car owners may be less sensitive to distance than non-car owners. The variety offered is approximated by the size of the shopping area offered in a zone.[5] Multipurpose trips are taken into account via the location of the job of household members: workers may combine their commuting trip with shopping trips. The last factor incorporated is local embeddedness. It is measured via the impact of the length of residence in a certain location. This is represented by the inclusion of the '*year*' variable that measures the number of years a member of a household has been already living in the town or the hinterland. Social networks tend to increase in strength with the time that people live in a zone. This may express itself in an increasing loyalty to local shops when people stay there longer. Another interpretation of the length of residence effect would be that newcomers in rural areas have a different spatial orientation that reveals itself among others in their shopping behaviour and that will continue to exist. Of course, the length of residence effect will be correlated with age, but since age is already incorporated in the utility function, this problem has been avoided so that what is found is not an age effect per se, but a length of residence effect. Note that since the authors only interviewed households from town and hinterland, $year_{iC} = 0$.

The utility of the supra-regional destination is modelled in a different way. The zone outside the region, the supra-regional zone, typically represents the set of larger cities located at longer distances from the towns under consideration that may attract rural shoppers. Since the authors did not have exact information on the shopping destinations in this category, they represented for each individual town the relevant information on distances and the size of shopping facilities in the larger cities by a 'supra-regional' dummy. Thus, one can take into account the specificities of each town's broader spatial setting. The pertaining dummy variables are defined as follows:

- $Oudewater_i = 1$ when i lives in or near the market town of Oudewater; or zero otherwise.
- κ is the associated coefficient representing the supra-regional attractiveness for shoppers from Oudewater.

A similar approach is followed for the other market towns.

Further, some household features are included to take into account household-specific variations in the orientation with respect to destinations located further away. In addition to the 'have a job there' dummy, these features are household income and the number of children (kids). Thus, one arrives at the following specification:

$$U_i(D) = \gamma job_{iD} + \zeta income_i + \eta(kids_i) + \kappa Oudewater_i + \lambda Gemert_i + \nu Nunspeet_i + \xi Schagen_i + oBolsward_i + \varepsilon_{iD} \quad (2)$$

For the descriptives of the independent and dependent variables, see Appendix B.

Results of the multinomial logit (MNL) model

Table 6 shows the results from the MNL analyses for zones A, B, and C. A separate run was performed for grocery, fun, and run shopping. As expected, the distance variable appears to have a significant negative impact on the utility: the further away a shop, the lower its utility to visit it and spend money there. This holds particularly for groceries and goal shopping and less for fun shopping. When households go shopping for fun, distance is less important.

The floor space variable has a significant positive effect on the utility. The parameter has a higher value for everyday purchases and a lower value for fun or goal shopping.

Besides the spatial variables, a set of socio-economic variables was added. Firstly, the place of work is important: when a member of the household has a job in the zone concerned, this increases its utility as a shopping destination so that it is more likely he or she will do some shopping there as well. Furthermore, owning a car reduces the distance sensitivity of shopping. However, this variable (a dummy for owning one or more cars multiplied by the (ln) distance) is only significant for goal shopping. For this kind of shopping it is plausible that owning a car makes it easier to travel further; goal shops are often located outside city/town centres, and the products bought can be relatively heavy and large, so that public transport or cycling are less attractive modes of transport. It could be expected that owning a car would also be significant for the distance sensitivity for fun shopping. However, it is often difficult to park in a city or town centre and most of these locations are easy to reach by public transport in the Netherlands.

In line with the literature (for example, PINKERTON *et al.*, 1995; POWE and SHAW, 2004; and PAPADOPOULOS, 1980), it was expected that the age variable would be positively significant as well. Many studies have found that older people tend to buy their products more locally. This fact was checked by interacting it with a distance component to see whether the elderly have a stronger distance sensitivity. Unexpectedly, it appears that the effect is small and not significant. This has partly to do with the last variable included in the utility functions of zones A, B, and C: the length of residence in town or hinterland as a measure of local embeddedness. This variable is not often added to these kinds of models.

Table 7. Estimation results of a multinomial logit model explaining the choice of shopping in zone D[a]

	Groceries (R^2-adjusted = 0.60)		Fun (R^2-adjusted = 0.13)		Goal (R^2-adjusted = 0.30)	
Explanatory variable	Coefficient	*t*-value	Coefficient	*t*-value	Coefficient	*t*-value
JOB	0.50	4.418	0.18	2.224	0.40	4.256
INCOME	0.08	0.715	0.14	4.522	0.10	2.105
KIDS	−0.13	−0.187	−0.44	−2.414	0.33	1.849
Oudewater	0.24	0.240	1.73	3.294	−0.43	−0.650
Gemert	0.51	0.489	1.87	3.491	−0.34	−0.483
Nunspeet	0.09	0.080	2.03	3.652	−0.38	−0.539
Schagen	−0.31	−0.269	0.82	1.483	−0.51	−0.730
Bolsward	−0.21	−0.200	1.83	3.487	−0.12	−0.185

Note: [a]Because of difficulties with the data, Dalfsen was exclude from the analysis.

When the length of residence is added (for example, Powe and Shaw, 2004; and Miller and Kean, 1997), the sign is positive for in-shopping. In the present model, too, it is (strongly) positively significant for buying groceries, and to a lesser extent for goal shopping. This means that the longer a household lives in a town or the hinterland, the more utility it has from shopping there. In the articles cited above, the authors do not include length of residence together with an age variable, so it is not known whether they have really measured a local embeddedness effect.[6] Of course, many older persons do tend to have lived for a long time in zones A and B.[7]

There are essentially two possible interpretations of the duration of residence effect: one would be that the duration effect reflects an increasing loyalty to local shops as time goes by. Newcomers have a weaker local orientation than people with a residence duration of say ten years, but after ten years their shopping behaviour will not be different from the orientation observed now for the group that arrived ten years ago. The other interpretation is that there is a constant cohort effect: newcomers now have a weaker orientation than that of newcomers when they entered ten years ago. The difference between the two interpretations is that in the first case with a population in a steady state, the local orientation would not change, whereas in the latter interpretation the local shopping orientation would decline. With the cross-section data available here, it is not possible to determine which of the two interpretations is the correct one. For that purpose one would need a combination of cross-section and time-series data. And, of course, it is also possible that a combination of the two interpretations applies. That would imply that there is indeed a decrease in local shopping orientation in the course of time, though not as large as with the constant cohort effect.

Table 7 shows the variables included in the utility function for shopping at larger distances in what has been coined here the supra-regional zone (D). This zone typically represents shopping opportunities in large cities far away from the (rural) town. Since the authors did not have access to data on the supply of shops at this scale, it was decided to represent the utility of this long-distance opportunity by means of destination-specific dummies, the work location dummy, plus some household-specific dummies. Households with a higher income seem to have a higher utility from shopping outside the region, especially related to fun shopping. This is in line with what was expected from the literature. On the other hand, households with children are less likely to travel outside the region for fun shopping. The parameter for goal shopping (by households with children in the supra-regional zone) is positive. Possibly these households need more specific products (for example, to decorate children's rooms). Finally, five town dummies were added. These were not significant for groceries or goal shopping. However, for fun shopping, all five dummies were significant, which is no surprise given the high values for the supra-regional zone in Table 7.

SUMMARY AND CONCLUSIONS

This article focused on the importance of towns in providing retail services to local consumers. In addition, it analysed the factors affecting the spatial shopping behaviour of households in rural areas. Information on about 6000 households from five European Union countries, living in town or in the direct hinterland of a town, was used.

Firstly, it can be concluded that today towns are still an important place for shopping: between 60% and 80% of town households' total purchases and between 40% and 60% of hinterland households' total purchases are bought in town. It is only in the Netherlands that hinterland households buy more in the hinterland. But here the hinterland is relatively densely populated.

Secondly, a focus was made on the behaviour of households buying goods and services in the town or hinterland in relation to the spatial characteristics of the area concerned. A correlation analysis showed the importance of spatial variables for both low-order and high-order goods and services in the thirty European towns. It appeared that spatial variables significantly affect spatial shopping behaviour and that the effects on low-order and high-order shopping are rather similar. Nevertheless, the level of significance and the size of the parameter often

differ, which indicates the importance of distinguishing between different goods and services.

An in-depth analysis was then performed for Dutch households, for which a multinomial logit model was developed taking into account both household and spatial characteristics. The analysis showed that particularly the location factors are very important to the spatial shopping behaviour of these households. General location factors, such as distance and floor space, are important for all kinds of shopping, but mostly for grocery shopping. The town-specific dummies, related to shopping outside the region, are only relevant for fun shopping. This reflects the relatively low attraction of rural areas for fun shopping, implying that rural residents have to travel long distances for this purpose.

In addition, it can be concluded that car ownership makes consumers less sensitive to distance, and since the ownership of more than one car is increasing in rural areas in the Netherlands, the effect will be even stronger. Ageing does not have a significant effect, but the location of jobs does. Increasing commuting distances will stimulate further out-shopping, as will income growth.

The findings of this analysis are particularly relevant for local policy-makers. The strong link between place of work and place of shopping implies that creating new jobs in town can have an additional advantage of more retail customers if the supply of shops is sufficient. Often, it is assumed that a successful retail sector and local vitality are closely related. Although there is no (empirical) proof for this (POWE *et al.*, 2009), it is true that local retail services are especially important to less mobile residents. Furthermore, the effect of length of residence implies that in towns with little population dynamics in-shopping will continue to take place, whereas strong population dynamics due to population growth will lead to much out-shopping among newcomers. However, for the local retail sector, this may nevertheless be favourable, since population growth would strengthen the economic basis for the retail activities.

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APPENDIX A

Table A1. *The thirty selected towns*

Country	Towns
England	Leominster
	Swanage
	Towcester
	Tiverton
	Burnham-on-Sea
	Saffron Walden
France	Brioude
	Prades
	Magny-en-Vexin
	Mayenne
	Douarnenez
	Ballancourt-sur-Essonne
Netherlands	Dalfsen
	Bolsward
	Oudewater
	Schagen
	Nunspeet
	Gemert
Poland	Glogówek
	Duzniki
	Ozarów
	Jędrzejów
	Ultsroń
	Lask
Portugal	Mirandela
	Tavira
	Lixa
	Vila Real
	Silves
	Esposende

APPENDIX B

Table B1. *Descriptive statistics of the (in)dependent variables*

ln*Dist*	Distance to the nearest shop of considerable size	ln (km)
ln*Floor*	Total size of the shop(s)	ln (m^2)
Job	Having a job in the zone concerned	Dummy
*Car**ln*dist*	Dummy for owning one or more cars multiplied by (ln) distance	Number of cars (ln (distance))
*Age**ln*dist*	Age of the head of the household (related to (ln) distance)	
ln*Year*	Length of residence in zones A and B (for purchases in zone C, zero was used)	ln (year)
Income	Household income	Ten classes
Kids	Having children or not	Dummy
Towndummy	Dummy for the specific town (five towns were included)	Dummy

Independent variable	Minimum	Maximum	Mean
Household characteristics			
Job A	0	1	0.23
Job B	0	1	0.29
Job C	0	1	0.25
Job D	0	1	0.20
Car	0	1	0.93
Age	20	75	50
Year AB	0	75	17.5
Kids	0	1	0.30
Shopping characteristics			
Distance A grocery	1	13	4.1
Distance B grocery	1	8.5	4.0
Distance C grocery	3	22	11.6
Floor A grocery	1797	8000	4865
Floor B grocery	60	3954	1177
Floor C grocery	1498	18 000	9634
Distance A fun	1	13	4.0
Distance B fun	1	21	7.4
Distance C fun	3	22	11.7
Floor A fun	3335	14 682	7691
Floor B fun	466	12 118	48 773
Floor C fun	825	2842	24 509
Distance A goal	1	13	4.0
Distance B goal	1	19	6.2
Distance C goal	3	22	11.7
Floor A goal	4297	30 119	12 928
Floor B goal	652	16 899	6492
Floor C goal	604	22 687	13 954

Dependent variable[a]	Minimum	Maximum	Mean
Grocery shopping A	0	1	0.65
Grocery shopping B	0	1	0.25
Grocery shopping C	0	1	0.09
Grocery shopping D	0	1	0.01
Fun shopping A	0	1	0.38
Fun shopping B	0	1	0.17
Fun shopping C	0	1	0.20
Fun shopping D	0	1	0.25
Goal shopping A	0	1	0.54
Goal shopping B	0	1	0.24
Goal shopping C	0	1	0.16
Goal shopping D	0	1	0.07

Note: [a]The share of a specific kind of shopping in zones A, B, C, and D.

NOTES

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2. These vehicles are mostly cars.
3. This share is fairly high because of a relatively large group of farmers in the database who for most of the time work close to their residence.
4. Distance to the nearest place with a shop of considerable size in the zone concerned. For grocery shopping, a shop of considerable size was set at a floor space of 60 m^2, and for fun and goal shopping it was 160 m^2.
5. That is, the floor space of shops in the nearest place with a shop of considerable size in the zone concerned.
6. BROWN (1993) looked at rural community satisfaction and attachment in mass consumer society, and found

that community satisfaction is primarily affected by length of residence. In this analysis, Brown also included age, which was not significant. In many studies, community satisfaction is seen as an important variable for in-shopping (for example, PINKERTON *et al.*, 1995). However, Brown did not find a significant relationship with in-shopping.

7. However, the bivariate correlation is only 0.47.

REFERENCES

ARENTZE T., BORGERS A. and TIMMERMANS H. (1993) A model of multi-purpose shopping trip behaviour, *Papers in Regional Science* **72**, 239–256.

BROWN R. B. (1993) Rural community satisfaction and attachment in mass consumer society, *Rural Sociology* **58**, 387–403.

CADWALLADER M. (1975) A behavioral model of consumer spatial decision making, *Economic Geography* **51**, 339–349.

CHRISTALLER W. (1933) *Die zentralen orte in Süddeutschland*. Fischer, Jena; trans. into English by BASKIN C. W. (1966) *Central Places in Southern Germany*. Prentice-Hall, Englewood-Cliffs, NJ.

CLARK W. and RUSHTON G. (1970) Models of intra-urban consumer behavior and their implications for central place theory, *Economic Geography* **46**, 486–498.

COURTNEY P. and ERRINGTON A. (2000) The role of small towns in the local economy and some implications for development policy, *Local Economy* **15**, 280–301.

COURTNEY P., MAYFIELD L., TRANTER R., JONES P. and ERRINGTON A. (2007) Small towns as 'sub-poles' in English rural development: investigating rural–urban linkages using sub-regional social accounting matrices, *Geoforum* **38**, 1219–1232.

CRAIG C. S., GHOSH A. and MCLAFFERTY S. (1984) Models of the retail location process: a review, *Journal of Retailing* **60**, 5–35.

DELLAERT B. G. C., ARENTZE T. A., MICHEL B., BORGERS A. W. J. and TIMMERMANS H. J. P. (1998) Investigating consumers' tendency to combine multiple shopping purposes and destinations, *Journal of Marketing Research* **35**, 177–188.

EVERS D., VAN HOORN A. and VAN OORT F. (2005) *Winkelen in Megaland*. Ruimtelijke Planbureau, The Hague.

FINDLAY A. and SPARKS L. (2008) Weaving new retail and consumer landscapes in the Scottish Borders, *Journal of Rural Studies* **24**, 86–97.

FINDLAY A. M., STOCKDALE A., FINDLAY A. and SHORT D. (2001) Mobility as a driver of change in rural Britain: an analysis of the links between migration, commuting and travel to shop patterns, *International Journal of Population Geography* **7**, 1–15.

GHALY N. S. (1990) *Trip Chaining Characteristics of Automobile Travel*. University of Pittsburgh, Pittsburgh, PA.

GORTER C., NIJKAMP P. and KLAMER P. (2003) The attraction of out-of-town shopping malls: a case study on run–fun shopping in the Netherlands, *Tijdschrift voor Economische en Sociale Geografie* **94**, 219–229.

HENSHER D. A., ROSE J. M. and GREENE W. H. (2005) *Applied Choice Analysis: A Primer*. Cambridge University Press, Cambridge.

HERMANN R. O. and BEIK L. L. (1968) Shoppers' movements outside their local retail area, *Journal of Marketing* **32**, 45–51.

HUBBARD R. (1978) A review of selected factors conditioning consumer travel behavior, *Journal of Consumer Research* **5**, 1–21.

HUFF D. L. (1959) Geographical aspects of consumer behavior, *University of Washington Business Review* **5**, 27–37.

HUFF D. L. (1964) Defining and estimating a trading area, *Journal of Marketing* **28**, 34–38.

KLEMMER P. (1978) Methods for the determination of centrality, in FUNCK R. and PARR J. B. (Eds) *The Analysis of Regional Structure: Essays in Honour of August Lösch*, pp. 54–61. Pion, London.

MERCADO R. and PÁEZ A. (2009) Determinants of distance traveled with a focus on the elderly: a multilevel analysis in the Hamilton CMA, Canada, *Journal of Transport Geography* **17**, 65–76.

MILLER N. J. and KEAN R. C. (1997) Factors contributing to inshopping behavior in rural trade areas: implications for local retailers, *Journal of Small Business Management* **35**(2), 80–94.

NEVIN J. R. and HOUSTON M. J. (1980) Image as a component of attraction to intra-urban shopping areas, *Journal of Retailing* **56**, 77–93.

OPPEWAL H. and HOLYOAKE B. (2004) Bundling and retail agglomeration effects on shopping behaviour, *Journal of Retailing and Consumer Services* **11**(2), 61–74.

PACIONE M. (2009) *Urban Geography: A Global Perspective*. Routledge, New York, NY.

PAPADOPOULOS N. G. (1980) Consumer outshopping research: review and extension, *Journal of Retailing* **56**(4), 41–58.

PINKERTON J. R., HASSINGER E. W. and O'BRIEN D. J. (1995) Inshopping by residents of small communities, *Rural Sociology* **60**, 467–480.

POPKOWSKI-LESZCZYC P. T. L., SINHA A. and SAHGAL A. (2004) The effect of multi-purpose shopping on pricing and location strategy for grocery stores, *Journal of Retailing* **80**(2), 85–99.

POWE N. A., HART T. and BEK D. (2009) Market town centres in England: meeting the challenge of maintaining their contemporary relevance, *Planning Practice and Research* **24**, 301–319.

POWE N. A. and SHAW T. (2004) Exploring the current and future role of market towns in servicing their hinterlands: a case study of Alnwick in the North East of England, *Journal of Rural Studies* **20**, 405–418.

SCHENK T. A., LÖFFLER G. and RAUH J. (2007) Agent-based simulation of consumer behaviour in grocery shopping on a regional level, *Journal of Business Research* **60**, 894–903.

TERLUIN I. J., VAN LEEUWEN M. and PILKES J. (2003) *Economic Linkages between Town and Hinterland: A Comparative Analysis of Six Small and Medium-Sized Towns in the Netherlands*. Agricultural Economics Research Institute LEI, The Hague.

THE COUNTRYSIDE AGENCY (2000) *England's Market Towns Meeting the Challenges of the 21st Century*. The Countryside Agency, Cheltenham.

THOMPSON J. R. (1971) Characteristics and behavior of out-shopping consumers, *Journal of Retailing* **47**, 70–80.

VAN LEEUWEN E. S. (2010) *Urban–Rural Interactions. Towns as Focus Points in Rural Development*. Contributions to Economics. Physica, Heidelberg.